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| 10/719,690 | 11/20/2003 | Mustafa Kesal | MS1-1665US | 1911 |

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LEE & HAYES PLLC
421 W RIVERSIDE AVENUE SUITE 500
SPOKANE, WA 99201

| EXAMINER | |
|---|---|
| WOLDEMARIAM, AKILILU K | |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/719,690 | KESAL ET AL. | |
| | Examiner | Art Unit | |
| | Aklilu k. Woldemariam | 2609 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date [illegible] 2007.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's response to Election/Restriction has been entered on 01/17/2008. Applicant has been elected Group I, without traverse for examination. Claims 1-13 have been elected.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 7 and 9-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Granger (U.S. Patent number 5,463, 720).

Regarding claim 1, *Grander discloses* a method, comprising filtering a scanned image to obtain a transformed image, wherein the transformed image *(see fig.33 and 34, and column 39, lines14- column 40, line 25, i.e., filter referred to Gaussian shaped and transformed image referred to halftone image with minimal screener induced artifacts)* comprises a series of substantially parallel lines of alternating binary pixel values *(see fig.2C, parallel lines halftone reference cell)*; and determining an orientation angle of the scanned image using properties of the transformed image *(see fig.2A and column 10, lines 18-55, determining an orientation angle referred to image scaling, rotation and halftone system 5)*.

Regarding to claim 7, *Granger discloses* that a computer-readable medium comprising computer-executable instructions that, when executed, direct a computer to *(see fig.7B, computer-readable medium referred to RAM):*

remove meaningful image information from a scanned image to generate a transformed image *(fig.33, removing meaningful image referred the filter for masking screener induced image artifacts)*; and

determine an orientation angle of the scanned image using the transformed image *(see fig.2C, orientation angle referred to rotation angle)*

Regarding to claim 9, *Granger discloses* the computer readable medium of claim 7, wherein the instructions for determining an orientation angle of the scanned image using properties of the transformed image comprise computer-executable instructions that, when executed, direct a computer to determine an orientation angle using the estimated periodicity of changes in binary pixel values along one or more rows of the transformed image and the estimated periodicity of changes in binary pixel values along one or more columns of the transformed image *(see fig.2C and column 14, lines 13-31, periodicity change)*.

Regarding to claim 10, *Granger discloses* the computer readable medium of claim 7, further comprising computer-executable instructions that, when executed, direct a computer to subtract a printing angle from the orientation angle to estimate a rotation angle *(see fig.33 and column 38, lines 60-64, i.e., subtracting referred to difference)*.

Regarding to claim 11, *Granger discloses* the computer readable medium of claim 7, wherein instructions for determining an orientation angle of the scanned image using

transformed image comprise computer-executable instructions that, when executed, direct a computer to determine an angle that maximizes a correlation function between the intersection of the transformed image and a matrix of binary values comprising at least one array of uniform binary values of the transformed image (*see fig. 23A, 23B and 32 and column 44, lines 9-27, maximize referred to high threshold value).*

Regarding to claim 12, *Granger discloses* the computer readable medium of claim 7, wherein instructions for determining an orientation angle of the scanned image using properties of the transformed image comprise computer-executable instructions that, when executed, direct a computer to *(see column 18, line 15, computer-executable referred to software)*:

generate a binary matrix, z, wherein z comprises rows of uniform binary values, and wherein the binary values of one row differ from the binary values of the remaining rows(*see fig.2C and column 10, lines 17-64, matrix referred to block)*; for a series of angles $\theta_i$, wherein $\theta_{min} \leq \theta_i \leq \theta_{max}$ generate an image $z_\theta$ by rotating z through $\theta_i$ degrees *(see fig.2C, rotating angle);*

generate at least one set of coordinates $(x_\theta, Y_\theta)$ *(see fig.13 and column 23, line 39-column 24, line 12);*

compute a correlation function between the binary values of the transformed image and the image $z_\theta$ positioned at $(x_\theta, Y_\theta)$ of the transformed image*(see fig. 23A, 23B and 32 and column 44, lines 9-27, computing correlation function referred compared each sampled contone value against a corresponding sampled threshold value in a threshold matrix*);and

select the angle $\theta_i$ that maximizes the correlation function (*see fig. 23A, 23B and 32 and column 44, lines 9-27, maximize referred to high threshold value)*.

Regarding to claim 13, *Granger discloses* the computer readable medium of claim 7, further comprising instructions for estimating a translation amount of the scanned image *(see fig.2C, estimating a translation amount referred to scaling)* that, when executed, direct a computer to:

subtract a printing angle from the orientation angle to estimate a rotation angle; rotate the scanned image through the rotation angle*(see fig.33 and column 38, lines 60-64, i.e., subtracting referred to difference)*; and

determine an (x, y) coordinate set that maximizes a correlation between a portion of the scanned image and an original digital image (*see fig. 23A, 23B and 32 and column 44, lines 9-27, maximize referred to high threshold value)*.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2-6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Granger as applied to claims 1 and 7, above in view of He et al., "He" (U.S. Patent number 7, 031, 025 B1).

Grander discloses filtering scanned image to obtain a transformed image.

Grander does not disclose applying a linear shift invariant filter to the scanned image to remove meaningful picture information from the scanned image.

However, He discloses regarding claim 2, method of claim 1, wherein filtering a scanned image to obtain a transformed image comprises applying a linear shift invariant filter to the scanned image to remove meaningful picture information from the scanned image *(see fig.10, column 9, line 57-column 10, line 46, i.e., a linear shift invariant).*

It would have been obvious to ordinary skill in the art at the time when the invention was made to use He's applying a linear shift invariant filter to the scanned image to remove meaningful picture information from the scanned image in Grander's filtering scanned image to obtain a transformed image because it will allow to optimize the quality of the image while matching the printing device characteristics, *[He, see column 3, lines 40-42].*

Regarding claim 3, *He discloses* the method of claim 1, wherein determining an orientation angle of the scanned image using properties of the transformed image comprises estimating a number of changes in binary pixel values along one or more rows of the transformed image *(see fig.2 and column 6, line 21-column 7, line 15, three adjacent pixels in the next rows);*

estimating a number of changes in binary pixel values along one or more columns of the transformed image *(see fig.2 and column 6, line 21-column 7, line 15, the in put pixel value, which has continuous-tone value, e.g. 0 to128, is represented as X(m,n), where m and n are pixel location).*

Regarding to claim 4, *Granger discloses* that the method of claim 1, further comprising subtracting a printing angle from the orientation angle to estimate a rotation angle *(see fig.33 and column 38, lines 60-64, i.e., subtracting referred to difference).*

Regarding to claim 5, *Granger discloses* the method of claim 1, wherein determining an orientation angle of the scanned image using properties of the transformed image *(see fig.2C, orientation angle referred to scale and rotation)* comprises:

generating a matrix , z, wherein z comprises rows of uniform binary values, and wherein the binary values of one row differ from the binary values of the remaining rows *(see fig.2C and column 10, lines 17-64, matrix referred to block)*; for a series of angles $\theta_i$, wherein $\theta_{min} \leq \theta_i \leq \theta_{max}$, repeating the operations:

generating a transformed matrix $z_\theta$ by rotating the matrix z through $\theta_i$ degrees *(see fig.2C, column 10, lines 17-64 matrix referred to block and rotation);* generating at least one set of coordinates $(x_\theta, Y_\theta)$ *(see fig.13 and column 23, line 39-column 24, line 12) ;* computing a correlation function between the binary values of the transformed image and the image $z_\theta$ positioned at $(x_\theta, Y_\theta)$ of the transformed image *(see fig. 23A, 23B and 32 and column 44, lines 9-27, computing correlation function referred compared each sampled contone value against a corresponding sampled threshold value in a threshold matrix)*; and selecting the angle $\theta_i$ that maximizes the correlation function( *see fig. 23A, 23B and 32 and column 44, lines 9-27, maximize referred to high threshold value).*

*Regarding to claim 6, Granger discloses the* method of claim 1, further comprising estimating a translation amount of the scanned image, wherein estimating a

translation amount (*see fig, 2C, translation amount of the scanned image referred to scaling and rotation)* comprises:

subtracting a printing angle from the orientation angle to estimate a rotation angle *(see fig.33 and column 38, lines 60-64, i.e., subtracting referred to difference)*;

rotating the scanned image through the rotation angle *(see fig.2C)*; and

determining an (x, y) coordinates set that maximizes a correlation between a portion of the scanned image and an original digital image (*sees fig. 23A, 23B and 32 and column 44, lines 9-27, maximize referred to high threshold value).*

Regarding to claim 8, *He discloses* the computer readable medium of claim 7, further comprising computer-executable instructions *(see column 12, lines 61-64, computer-readable medium)* that, when executed, direct a computer to apply a linear shift invariant filter to the scanned image to remove meaning image information from the scanned image *(see fig.10, column 9, line 57-column 10, line 46, i.e., a linear shift invariant).*

***Allowable Subject Matter***

6. In Claim 3 a single limitation is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. *In claim 3, the limitation, "determining an orientation angle using the arctangent of the number of changes in binary values along one or more columns divided by the number of changes in binary values along one or more rows." None of the references teach this claim limitation.*

***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aklilu k. Woldemariam whose telephone number is 571-270-3247. The examiner can normally be reached on Monday-Thursday 6:30 a.m-5:00 p.m EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on 571-272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Samir Ahmed
SPE
Art Unit 2624

A.W.
02/25/2008

SAMIR AHMED
SUPERVISORY PATENT EXAMINER